Mental Models: Have users ' mental models of search engines impro ved in the last ten years?

Name: Sifiso Mlilo

Student number: 0606990D

Supervisor: Prof. Andrew Thatcher

A research project submitted in partial fulfilment of the requirements for the degree of MA by coursework and Research Report in the field of Organisational Psychology in the Faculty of Humanities, University of the Witwatersrand, Johannesburg, 13 December 2010

I declare that this research report is my own, unaided work. It has not been submitted before for any other degree or examination at this or any other university

Word count:

Signed: _____

Date: _____

ABSTRACT

Mental models can be defined as mental representations or cognitive mappings of external systems that allow for effective descriptions, explanations and predictions of those systems (Staggers & Norcio, 1993). The quality of usersô mental models of search engines has been investigated in a number of studies across a range of disciplines. The results have been uniform in concluding that usersô mental models of search engines are inaccurate and incomplete (Jansen & Spink, 2006; Muramatsu & Pratt, 2001; Thatcher & Greyling, 2003). This conclusion has corroborated studies proposing that users show poor search performance (Muramatsu & Pratt, 2001). This study investigated the accuracy and completeness of mental models users have of search engines in the context of a comparison of matched data obtained from samples from 2000 and 2010. The same methodology employed in the study conducted on the 2000 sample was used. Eighty volunteer participants were asked to complete a maximum of two computer-based tasks and onscreen capture software was used to record their search actions (time, steps, etc.). The recordings were then played back to the participants and a retrospective protocol interview was conducted to determine the reasoning behind their actions. They were also asked to provide an illustration of how they thought a search engine worked. A short satisfaction and confidence questionnaire was also administered. Statistical significance was found for the performance measures of *time* and *steps.* The differences were quite large with the 2010 sample using less than half the time used by the 2000 sample and almost half the number of steps. The performance was still significant after controlling for experience. The chi-squared test conducted for the performance measure *accuracy* also revealed statistical significance with the 2010 sample showing significantly greater accuracy. The chi-squared comparison of the salient features indicated that seven of the seventeen features were more frequent at Time 2. Seven of the salient features were more frequent at Time 1. Where the cluster analysis of the 2000 sample revealed four distinct clusters, three clusters emerged from the 2010 sample. It was clear from the analyses conducted that, even if not to a large degree, the accuracy and completeness of usersô mental models of search engines had demonstrably improved in the last decade. So while usersô mental models of search engines remain inaccurate and incomplete, their alignment with designerôs conceptualisations has improved.

Acknowledgments

I am indebted to my supervisor Professor Andrew Thatcher, for the incredible support and faith you have shown throughout the process. Your incredible willingness to share your outstanding expertise and provide unyielding encouragement made this whole process thoroughly enjoyable.

My deepest thanks go to Denise for your incredible assistance and encouragement throughout the duration of the project. Your exemplary efforts made a huge contribution in ensuring the success of this project.

Special thanks to my mom, sister, grandmother and aunt for the immense support you have all provided. The encouragement and faith you have constantly shown has been invaluable in assisting me complete this piece of work.

Warm thanks go to Khanyi for your remarkable support throughout the project. Your genuine interest and care in helping me in any way possible meant a great deal.

Special thanks to my classmates Sarika and Castro for your outstanding support and willingness to assist. The wonderful friendship we share has grown immeasurably since last year and has made this year truly memorable.

My sincerest thanks go out to all who showed a willingness to participate in my research. Your contributions are all greatly appreciated.

Many thanks go to everyone else who helped at some or other stage of the project.

Contents